

Appl. No. 10/666,493
Reply to Office Action of August, 2005

REMARKS

Claims 1, 7 and 12 are amended. Claims 20-28 are canceled and Claim 29 is added to avoid additional examination fee on this added claim.

The word "downward" is added in Claims 1 and 12. The amendment of Claim 1 is supported by the sentence "During draining, fluid 138 in the tank flows from the processing region 122 through the regulating plate 108, through the draining region 126, and out the drain opening 118." Col.4, p.13.

Claims 1-4 were rejected under 35 U.S.C. §102(b) as being anticipated by the APA (admitted prior art). Claims 1-3, 5, 7, 10, 12, 13 and 18 were rejected under 35 U.S.C. §102(b) as being anticipated by Jeong (US 6,228,211). Claims 1-5, 12 and 13 were rejected under 35 U.S.C. § 102(b) as being anticipated by Shindo et al. (US 5,845,660). Claims 6 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shindo et al. Claims 6 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jeong in view of Shindo et al. Claims 9, 11, 14, 16 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jeong in view of Sonoda et al. (US 6,616,774).

Claim 1 requires "a regulating means with openings disposed in said tank and over said drain opening to control **downward** draining rate and **downward** draining direction of said fluid." The element 46 described in APA is a valve means without openings, but not a regulating means with openings as to control **downward** draining rate and **downward** draining direction of said fluid as required by claim 1. The valve means 46 is not equivalent to the regulating means of Claim 1. The mere use of the valve means 46 will result in a quick water flow between wafers near to the draining opening. The quick water flow creates positive pressure on the left surface of the left-center wafer 18a and on the right surface of the right-center wafer 18b. These wafers 18a and 18b will stick to each other due to the quick water flow. Though the valve means 46 might control drain rate and direction, the mere use of the valve means 46 causes the wafer sticking problem described in APA. Without the regulating means 108, the valve means 46 does not solve the issue which is solved by this application. Thus one of ordinary skill in the art

Appl. No. 10/666,493

Reply to Office Action of August, 2005

would not have considered the valve 46 to be equivalent to the structure in Applicant's specification corresponding to the regulating means.

For at least this reason, Claim 1 would not be anticipated by APA.

Claims 2-4 are dependent on Claim 1. Because Claim 1 is not anticipated by the APA, Claims 2-4 should not be anticipated by the APA, either.

Claims 1-3, 5, 7, 10, 12, 13 and 18 were rejected under 35 U.S.C. §102(b) as being anticipated by Jeong (US 6,228,211). Claim 1 requires "a regulating means with openings disposed in said tank and over said drain opening to **control downward draining rate and downward draining direction of said fluid.**" Claim 12 requires "a regulating plate dividing said tank into a processing region and a draining region, wherein said regulating plate comprises a plurality of slats and openings, wherein, during draining, **fluid in said tank flows from said processing region through said regulating plate, through said draining region, and out said drain opening.**" Jeong discloses an apparatus for etching a glass substrate. In Jeong's patent, the bubbling plate 3 provides bubbles passing through holes 30 of the porous plate 4 to remove the impurities on the surface of the glass substrate 11, lines 59-67, col. 3. Jeong does not mention use of the bubbling plate 3 to control downward draining rate and downward draining direction of said fluid. Jeong also does not mention that the fluid in the tank will flow through the bubbling plate 3. Furthermore, bubbles provided by the bubbling plate 3 may cause turbulence and interfere with smooth flow of the fluid in the tank. Accordingly, the bubbling plate 3 can also cause wafer sticking issue due to the current turbulence caused by bubbles. Jeong thus does not suggest the use of the regulating means with openings to control downward draining rate and downward draining direction of the fluid. After reading Jeong's patent, one of ordinary skill in the art would not apply Jeong's bubbling plate 3 to solve the wafer sticking problem due to the current turbulence caused by bubbles.

For at least these reasons, Claims 1 and 12 is not anticipated by Jeong and should be allowed.

Appl. No. 10/666,493

Reply to Office Action of August, 2005

Claims 2, 3, 5, 7 and 10 are dependent claims of Claim 1. They are not anticipated by Jeong for at least the same reasons set forth above with reference to Claim 1. For the same reason, Claims 13 and 18 are not anticipated by Jeong because Claims 13 and 18 are dependent on Claim 12 and Claim 12 is not anticipated by Jeong.

Claims 1-5, 12 and 13 were rejected under 35 U.S.C § 102(b) as being anticipated by Shindo et al. (US 5,845,660). Claim 1 requires "a regulating means disposed in said tank and over said drain opening to control **downward** draining rate and **downward** draining direction of said fluid." Claim 12 requires "a regulating plate dividing said tank into a processing region and a draining region, wherein said regulating plate comprises a plurality of slats and openings, wherein, during draining, **fluid in said tank flows from said processing region through said regulating plate, through said draining region, and out said drain opening.**" Shindo discloses a substrate washing and drying apparatus. In Shindo's patent, the rectifying means 25 comprises a porous plate 25a and a diffusion plate 25b, lines 20-21, col. 7. Shindo does teach using the rectifying means to control **downward** draining rate and **downward** draining direction of fluid as required by claim 1. In fact, FIG. 9 of Shindo describes two supply/discharge ports 24 formed on the bottom of the inner vessel 20a so that pure water 91 can be supplied to the inner vessel 20a through these supply/discharge ports 24 (col. 10, lines 26-30). The supply of pure water 91 supplied by these supply/discharge ports 24 results in **upward** fluid current. Also, the pure water 91 flows from these supply/discharge ports 24 through the rectifying means 25, through the boat 21, and overflows from the upper end portion of the inner vessel 20a (col. 9, lines 33-38). Thus, the pure water will flow from the bottom of the tank, through the rectifying means 25, through the process region, and then out of the tank, but not from the process region, through the regulating plate, through said draining region, and out said drain opening as required by Claim 12. Shindo's patent thus provides an **upward fluid current flow**, rather than a downward current flow. When solving a wafer sticking problem with a downward current flow, one of ordinary skill in the art would not adopt Shindo's structure, which has an upward fluid current flow, because the upward flow of pure water might cause turbulence in the tank when the wafer sticking issue tried to be solved with the fluid supplied **downwardly** as required by Claim 1. Unlike a method according to claim 1 or 12, Shindo's method may result in wafer sticking. Shindo thus fails to suggest one of ordinary skill in the art to apply Shindo's patent to

Appl. No. 10/666,493
Reply to Office Action of August, 2005

solve the wafer sticking issue with a downward current flow due to the current turbulence. Accordingly, Shindo not only fails to disclose features of Claims 1 and 12, but also teaches away from the present application by providing upward water flow in the wet tank.

For at least these reasons, Claims 1 and 12 are not anticipated by Shindo.

Claims 2-5 are dependent claims of Claim 1. They are not anticipated by Shindo for at least the same reasons set forth above with respect to Claim 1. For the same reason, Claim 13 is not anticipated by Shindo because Claim 13 is dependent on Claim 12.

Claims 6 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shindo et al. Because Shindo not only fails to disclose features of Claims 1 and 12, but also fails to suggest one of ordinary skill in the art to apply Shindo's patent to solve the wafer sticking issue with a downward current flow due to the current turbulence, Claims 6 and 16 would be patentable over Shindo.

Claims 6 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jeong in view of Shindo et al. However, the combined teachings of Jeong and Shindo fail to disclose or suggest the features of the independent Claims 1 and 12. Claims 6 and 16 are dependent on claims 1 and 12, respectively, and should be patentable for at least the same reason.

Claims 9, 11, 14, 16 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jeong in view of Sonoda et al. (US 6,616,774). Claims 9 and 11 are dependent on Claim 1. As described above, Jeong fails to disclose or suggest to use the bubbling plate to solve the wafer sticking issue due to current turbulence. Sonoda's disclosure also fails to cure the deficiency of Jeong's disclosure with respect to the features of the independent Claims 1 and 12. Therefore, claim 9, should be patentable, and is not subject to rejection under 35 U.S.C. §103(a). For the same reason, Claims 14, 16 and 19, which are dependent on Claim 12 should be patentable.

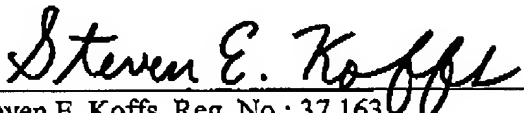
Appl. No. 10/666,493
Reply to Office Action of August, 2005

In view of the foregoing amendments and remarks, Applicant submits that this application is in condition for allowance. Early notification to that effect is respectfully requested.

The Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment that may be associated with this communication to deposit account 04-1679.

Respectfully submitted,

Dated: 11-8-05


Steven E. Koffs, Reg. No.: 37,163
Attorney For Applicants

DUANE MORRIS LLP
30 South 17th Street
Philadelphia, Pennsylvania 19103-4196
(215) 979-1250 (Telephone)
(215) 979-1020 (Fax)